Regulatory Analysis

Of

Proposed Amendments to Iowa Administrative Code 567 Chapter-65, “Limitation of Liquid Manure Application to Soybeans”

Notice of Intended Action

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I. Introduction

Subsection 1 of Iowa Code section 17A.4A, states that upon written request by the administrative rules review committee or the administrative rules coordinator or 25 small businesses or an organization that represents them, an agency shall issue a regulatory analysis of a proposed rule that complies with subsection 2 of Iowa Code section 17A.4A. The elements to be included in the regulatory analysis are specifically identified as follows:

(1) A description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule.
(2) A description of the probable quantitative and qualitative impact of the proposed rule, economic or otherwise, upon affected classes of persons, including a description of the nature and amount of all of the different kinds of costs that would be incurred in complying with the proposed rule.
(3) The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.
(4) A comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction.
(5) A determination of whether less costly methods or less intrusive methods exist for achieving the purpose of the proposed rule.
(6) A description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule.

Specific to small businesses, Iowa Code section 17A.4A(2)(b) requires that an agency consider whether it would be feasible and practicable to do any of the following to reduce the impact of the rule on small business:

(1) Establish less stringent compliance or reporting requirements in the rule for small business.
(2) Establish less stringent schedules or deadlines in the rule for compliance or reporting requirements for small business.
(3) Consolidate or simplify the rule's compliance or reporting requirements for small business.
(4) Establish performance standards to replace design or operational standards in the rule for small business.
(5) Exempt small business from any or all requirements in the rule.

The Department of Natural Resources (Department) has received a regulatory analysis request from the Iowa Commercial Nutrient Applicators Association and is providing the following regulatory analysis for **ARC 5636B**. Each of these elements will be addressed in turn following a summary of the background of the proposed rule making.

II. Background

The Environmental Protection Commission proposed rules to limit the application of liquid swine manure or settled open feedlot effluent to land that is currently planted or will be planted to soybeans. The proposed rules were approved for public comment by the Commission at its December 12, 2006 meeting, and the proposed rules were included in a Notice of Intended Action published on January 3, 2007 in the *Iowa Administrative Bulletin* as **ARC 5636B**.

Previous research has shown that subsurface tile drainage from row-crop, agricultural production systems has been identified as a major source of nitrate entering surface waters[1]. Nitrate losses are highly related to cropping system, with row crops such as corn and soybeans yielding much greater drainage volumes and nitrate-N concentration in the drainage water than perennial crops such as alfalfa and CRP grass/legume mix. The nitrate-N losses can be 30 to 50 times higher in row crops than perennial crops[2].

It is widely know that Rhizobium bacteria will fix atmospheric nitrogen through a symbiotic relationship with soybeans. The soybean plants can then utilize that nitrogen to produce grain. It is also known that soybean plants will preferentially use nitrogen already in the soil rather than produce more nitrogen. Soybeans use the greatest amount of nitrogen later in the growing season. But about two-thirds of annual drainage and nitrate loading occur in April, May and June when evapotranspiration is low compared to precipitation[3]. Since manure would usually be applied to the crop ground prior to planting the soybean crop, the nitrogen in that manure could be more prone to loss through drainage tile.

The result of liquid manure or settled open feedlot effluent application to fields to be planted to soybeans is additional nitrogen (and other nutrients) available in the soil during the months when tile drainage is generally the greatest. This potentially could increase the amount of nitrogen that can enter surface waters through tile drainage systems, having a detrimental effect on the quality of those surface waters.

Commercial nitrogen is not normally applied to a soybean crop since it is an unnecessary expense. If liquid manure or settled open feedlot effluent application is not allowed on fields to be planted to soybeans, that liquid manure or settled open feedlot effluent would be available for application to fields that would otherwise receive commercial nutrient applications. By replacing the commercial nutrients with manure nutrients, less nitrogen is introduced in the

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[1] Gyles Randall, The Impact of Climate and Agricultural Practices on Nitrogen Losses in Tile Drainage in Minnesota, Hydrol. Sci. & Tech. 18:187-195 (2002).
[2] G.W. Randall and M.J. Goss, Nitrate Losses to Surface Water through Subsurface, Tile Drainage, *In* R.F. Follet and J.L. Hatfield (Eds). Nitrogen in the Environment: Sources, Problems, and Management. Pp 95-122. Elsevier Science B.V. Amsterdam (2001).
[3] Gyles Randall, The Impact of Climate and Agricultural Practices on Nitrogen Losses in Tile Drainage in Minnesota, Hydrol. Sci. & Tech. 18:187-195 (2002).

cropping system, which could result in less nitrogen being transported to surface waters. This is because there could be less total nitrogen applied to all crop production fields in the state. The net result could be an improvement in surface water quality.

III. Elements of the Analysis

A. *Description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule.*

All Iowans could be affected by the proposed rules. Owners and operators of confinement feeding operations required to have a manure management plan (MMP) and owners and operators of open feedlots with a nutrient management plan (NMP) could be affected as there would be limitations on where liquid manure and settled open feedlot effluent from their operations could be land applied. Crop producers who receive the manure nutrients could be affected if they utilize those manure nutrients to provide nutrients to soybean acres. Manure applicators, both confinement site and commercial, could be affected as they may be required to transport manure greater distances to apply manure to fields that will not be planted to soybeans. The applicators may also need to invest in new equipment if they apply manure nutrients to soybean acres at the reduced rate. Iowans traveling on roadways could be impacted as manure application equipment could spend more time on roadways if hauling distances are increased.

The financial costs of the proposed rules will be borne by the entities that must pay to have the manure hauled and land applied. If manure must be transported greater distances to land apply, there will be added expense and labor involved with hauling greater distances. New equipment may be required for applicators to be able to apply at a reduced rate. Commercial manure applicators will be able to pass on that expense to the entity that pays for the manure hauling and application. This could be the animal feeding operation owner, the operator of the farm ground that receives the manure nutrients, or some combination of both. Confinement site applicators will bear the cost themselves, although some may receive compensation from neighboring land owners that receive manure. Owners of the feeding operations may be required to develop new MMPs or NMPs. This will require additional time on their part or additional fees from entities they may hire to develop their plans. In the end, the agricultural producers that benefit from manure removal, hauling and application will bear the additional costs resulting from the proposed rules.

All Iowans could benefit from improved water quality that may result from implementation of the proposed rules. In addition, municipalities could benefit

through reduced costs to treat water prior to use by the public. An example is the city of Des Moines, which operates a nitrate removal facility to remove nitrate in order to keep nitrate-nitrogen below 10 mg/L.

B. *A description of the probable quantitative and qualitative impact of the proposed rule, economic or otherwise, upon affected classes of persons, including a description of the nature and amount of all of the different kinds of costs that would be incurred in complying with the proposed rule.*

Adequate land is available in the state for proper application of all manure produced in the state. Less than 20 percent of corn acres that receive nutrient applications get the nutrients from manure[4]. In fact, Iowa has adequate crop production land to properly utilize the manure produced by all hogs and cattle fed in the US[5]. So land availability for proper manure application is not an issue. But the proximity of the crop production fields to the manure producing livestock units could be an important issue. Many MMPs include more application land than is required for proper application, so a restriction on application to soybeans probably would not result in a shortage of application land, but could decrease the application possibilities.

The actual increased costs for manure application under the proposed rule is nearly impossible to determine, due to the many variables involved with how much application would change. Implementation of the proposed rule would probably result in increased application costs, due to greater hauling distance for application, requiring more fuel usage and labor demands. In addition some facility owners would be required to develop and file new MMPs or NMPs if their current plans include manure application to soybeans.

C. *The probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues.*

The proposed rules will not greatly impact the department. Reviews of MMPs and NMPs may take slightly more time as there will be another restriction to be checked, but it should not greatly impact review time. Additional staff time could be required during field inspections to insure compliance with the proposed rule.

There will be no impact on state revenues.

D. *A comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction*.

The costs for implementing the proposed rules are nearly impossible to calculate, but would include increased costs for hauling manure greater distance (in fuel,

[4] Manure vs. commercial fertilizers: It's the same thing, Iowa Pork Producers Association, second edition.
[5] Bruce Babcock, Is Now the Time to Raise Livestock?, Presented at "Farming Matters", March 28, 2006

labor and equipment wear), additional equipment expense to allow application at reduced rates, possible redevelopment of MMPs and NMPs that include manure application to soybeans, and some additional department staff time for review of plans and compliance assurance. The benefits are also nearly impossible to determine as it is unknown how much nitrate-nitrogen will be reduced in the state's surface waters, so it is unknown how much water treatment plants can save in reduced treatment.

Assuming the manure nutrients that would be applied to soybeans would instead be applied to crop production land that would otherwise receive commercial fertilizer applications, those crop producers may pay less for nutrient application to those crop production fields. This would result in commercial fertilizer dealers selling less commercial fertilizer, resulting in decreased profits for their companies.

A restriction of manure application to soybeans could result in decreased soybean yields in some fields. This is a clear conflict between maximum yields (and economic benefit) vs. improved water quality – the standard debate of economy vs. environment. If the yield depression were too great, producers would be able to apply commercial fertilizer to those fields, which would not be in conflict with the proposed rules.

The benefit of cleaner water for the state is difficult to measure , especially without evidence of how much improvement there would be if the proposed rules are implemented.

Therefore it is impossible to compare the costs and benefits of implementing the rules with the results of inaction.

E. *A determination of whether less costly methods or less intrusive methods exist for achieving the purpose of the proposed rule.*

The overall purpose of the proposed rule is to improve the quality of Iowa's surface water for all Iowans. There are numerous sources of impairment to the state's surface waters and implementation of the proposed rule may result in only a small improvement in water quality.

There is probably no less costly method of trying to reduce nitrates in surface waters than by decreasing the application of nutrients that aren't necessary. An alternative and possibly more cost prohibitive method would be to restrict manure applications to the period of the crop's growth cycle when nutrient demand is the greatest. Most manure is applied to crop ground in the fall after harvest or the spring prior to planting. But the crop's greatest demand for nutrients is later in the growing season. So the nutrients are present in the soil profile waiting for the crop's time of greatest need, sometimes up to 9 months. The nitrogen is susceptible to movement to tile lines during this time. So an alternative could be to limit manure application to the period of the growing season when crops have

the greatest demand for nutrients. However this alternative is probably less appealing due to a more restrictive time frame for manure application and the need to apply between the rows of a growing crop, which can be very challenging.

F. *A description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule.*

There were no alternative methods considered for achieving the purpose of the proposed rule. The proposed rule is probably the most acceptable method for attempting to reduce nitrate loss to drainage tile with subsequent impairment to surface waters. However there is no estimate of how much improvement there could be in surface water quality.

The initial proposal was a complete ban on liquid manure and settled open feedlot effluent application to soybeans. However the proposed rules delay the complete ban for five years and restrict the application to 100 lbs of nitrogen per acre as recommended by Iowa State University.

G. *Iowa Code section 17A.4A(2)(b) considerations*

As stated previously, the complete ban would be delayed for five years and an associated study of any new research available six months prior to the end of that five year period would be considered prior to implementation of the ban. This is a less stringent schedule than previously proposed.

Reporting requirements for small businesses would be the same as without adoption of the proposed rule. Performance standards are not known, since the benefit that will be attained is difficult to measure, and therefore a performance based standard is not feasible. Exempting small businesses from the proposed rule would defeat the purpose of the rule.

H. *Iowa Code 17A.4A(3) considerations*

There is no data on the actual impact the proposed rule could have on the quality of the state's surface waters. Although studies show a connection between nitrogen nutrient applications and nitrogen losses through drainage tile lines, there have not been studies conducted to examine the practices to be limited by the proposed rule.

The short-term and long-term consequences of the proposed rule would be increased manure application costs for some livestock and/or crop operations with an unknown improvement in quality of the state's surface waters.